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NORTH CENTRAL FOREST EXPERIMENT STATION, FOREST SERVICE—U.S. DEPARTMENT OF AGRICULTURE

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BLACK CHERRY VOLUME TABLES FOR FURNITURE-TYPE, FLAT, 4/4-INCH DIMENSION FROM SMALL LOW-QUALITY TREES

ABSTRACT.--volume tables are given for yield of clear-one-side, flat dimension from small, low-quality trees and bolts removed in a stand improvement cut of 54- to 76-year-old black cherry trees from northern Pennsylvania.

OXFORD: 526.6:176.1 *Prunus serotina*.
KEY WORDS: bolter saw, bolts, flitches, cut-stock, thinnings.

Presented here are volume tables based on the yields of 4/4-inch-thick clear-one-side (C1S) grade, furniture-type dimension, cut from small low-quality black cherry (*Prunus serotina*) trees. These trees were removed in a timber stand improvement cut from a 54- to 76-year-old pulpwood-size stand near Coudersport, Pennsylvania.[1]

All trees were cut off at a 6-inch top diameter inside bark (d.i.b.). The procedures used for sawing and cut-up were described previously.[2] Thirty trees were hauled to the North Central Forest Experiment Station Wood Processing Pilot Plant near Carterville, Illinois and were bucked into 283 short bolts 2 to 6-1/2 feet long. Then the bolts were sawed into 1-1/8-inch-thick flitches on a portable bolter saw. Sixty-three of the bolts had one or two faces clear; the rest had no faces clear. The flitches were then kiln-dried to 8 percent moisture content and skip-dressed to 15/16-inch thickness.

The square foot area of dimension was measured by diagramming various size clear-one-side cuttings on each flitch. Cuttings 1 to 6 inches wide and 12 to 72 inches long were recorded for each flitch. Most of the cuttings were small: 40 percent were in the 1.5-inch-width class and 52 percent in the 24-inch-length class.

The tables show the maximum volumes recovered from low-quality material cut with a bolter saw. Losses due to further processing were estimated on a sample of flitches from 14 low grade bolts. The flitches were ripped into 2-1/4-inch-wide strips, and the strips were finger-jointed and edge-glued C1S panels. The trials showed that more wood is lost when ripping to a specific width and then crosscutting out the defects than when cutting random widths and lengths. Yield of 2-1/4-inch-wide strips was about 86 percent of the yield of random cut-up obtained by diagramming the same flitches. Crosscutting the defects from the 2-1/4-inch strips and then finger-jointing the ends reduced the yield further. The yield in panels made from the defect-free, finger-jointed strips was 72 percent of the diagrammed C1S yield. These trials illustrate how the volume tables presented here can provide a starting point in determining yields of products for a potentially higher value use for material from low-quality trees and bolts than for other roundwood products.

[1] *The collection of sample trees was made in cooperation with the Department of Environmental Resources, Commonwealth of Pennsylvania, Harrisburg, Pennsylvania.*

[2] *D. E. Dunmire, E. F. Landt and R. E. Bodkin. Logging residue is a source of valuable black walnut dimension. For. Prod. J. 22(1): 13-17, illus. 1972.*

Table 1.--*Bolt volume table for clear-one-side (C1S), flat, nominal 4/4-inch dimension black cherry*[1]
(In square feet)

Bolt d.i.b. small end (inches)	Bolt length (inches)																Number of bolts
	20	24	28	32	36	40	44	48	52	56	60	64	68	72	76	80	
5	0.60	0.75	0.91	1.07	1.24	1.42	1.60	1.78	1.96	2.15	2.35	2.54	2.74	2.95	3.15	3.36	2
6	.96	1.20	1.46	1.72	1.99	2.27	2.55	2.85	3.15	3.45	3.76	4.07	4.39	4.72	5.05	5.38	88
7	1.43	1.79	2.17	2.56	2.96	3.38	3.80	4.24	4.68	5.14	5.60	6.07	6.54	7.03	7.51	8.01	79
8	2.01	2.53	3.06	3.61	4.18	4.77	5.37	5.99	6.61	7.25	7.90	8.57	9.24	9.92	10.61	11.31	58
9	2.73	3.42	4.15	4.90	5.67	6.47	7.28	8.12	8.97	9.83	10.72	11.61	12.52	13.45	14.38	15.33	24
10	3.58	4.49	5.45	6.43	7.45	8.49	9.56	10.66	11.77	12.91	14.07	15.25	16.44	17.66	18.89	20.13	19
11	4.58	5.75	6.97	8.23	9.53	10.86	12.23	13.63	15.06	16.52	18.00	19.50	21.03	22.59	24.16	25.75	8
12	5.74	7.20	8.72	10.30	11.93	13.60	15.31	17.07	18.86	20.68	22.53	24.42	26.34	28.28	30.25	32.24	3
13	7.05	8.85	10.73	12.67	14.67	16.72	18.83	20.99	23.19	25.43	27.71	30.03	32.39	34.77	37.20	39.65	1
14	8.54	10.72	12.99	15.34	17.76	20.25	22.81	25.42	28.08	30.80	33.56	36.37	39.22	42.11	45.05	48.02	1
15	10.21	12.81	15.52	18.33	21.23	24.21	27.26	30.38	33.56	36.80	40.11	43.46	46.87	50.33	53.84	57.39	-
Number of bolts	-	20	14	9	37	12	6	105	36	6	2	2	1	27	6	-	283

[1]Regression equation for C1S square feet=$0.000224 \times \text{Diameter}^{2.58357} \times \text{Length}^{1.24537}$ (based on all bolts). Standard error of estimate=1.189 square feet. $R^2=0.95$.

NOTE: Heavy black lines indicate distribution of data.

Table 2.--*Tree volumes for clear-one-side (C1S)*[1] *flat, nominal 4/4-inch dimension and dimension recovery factors (DRF)*[2]
(C1S volumes in square feet)

D.b.h. (inches)	Item	Tree height to a 6-inch d.i.b. top (feet)											Number of trees
		10	15	20	25	30	35	40	45	50	55	60	
6	C1S	5.15	7.32	9.40	11.41	13.37	15.28	17.16	19.01	20.83	22.63	24.41	-
	DRF	*2.97*	*3.01*	*3.03*	*3.05*	*3.07*	*3.08*	*3.09*	*3.11*	*3.12*	*3.12*	*3.13*	
7	C1S	7.29	10.37	13.31	16.15	18.92	21.63	24.30	26.91	29.49	32.04	34.55	1
	DRF	*3.21*	*3.25*	*3.28*	*3.30*	*3.32*	*3.33*	*3.34*	*3.36*	*3.37*	*3.38*	*3.38*	
8	C1S	9.85	14.01	17.98	21.83	25.57	29.23	32.83	36.36	39.85	43.29	46.68	7
	DRF	*3.43*	*3.47*	*3.50*	*3.53*	*3.55*	*3.56*	*3.58*	*3.59*	*3.60*	*3.61*	*3.62*	
9	C1S	12.84	18.27	23.45	28.46	33.35	38.12	42.81	47.42	51.97	56.45	60.88	9
	DRF	*3.64*	*3.69*	*3.72*	*3.74*	*3.76*	*3.78*	*3.79*	*3.81*	*3.82*	*3.83*	*3.84*	
10	C1S	16.29	23.16	29.74	36.09	42.29	48.34	54.29	60.13	65.90	71.58	77.20	4
	DRF	*3.84*	*3.89*	*3.92*	*3.95*	*3.97*	*3.99*	*4.00*	*4.02*	*4.03*	*4.04*	*4.05*	
11	C1S	20.19	28.71	36.86	44.74	52.42	59.93	67.30	74.55	81.69	88.74	95.70	3
	DRF	*4.03*	*4.08*	*4.11*	*4.14*	*4.16*	*4.18*	*4.20*	*4.21*	*4.23*	*4.24*	*4.25*	
12	C1S	24.57	34.94	44.85	54.44	63.78	72.92	81.88	90.70	99.39	107.97	116.44	4
	DRF	*4.21*	*4.26*	*4.30*	*4.33*	*4.35*	*4.37*	*4.39*	*4.40*	*4.41*	*4.43*	*4.44*	
13	C1S	29.42	41.84	53.72	65.21	76.39	87.34	98.07	108.64	119.05	129.32	139.47	-
	DRF	*4.38*	*4.44*	*4.47*	*4.50*	*4.53*	*4.55*	*4.57*	*4.58*	*4.60*	*4.61*	*4.62*	
14	C1S	34.77	49.45	63.49	77.06	90.28	103.21	115.91	128.39	140.69	152.83	164.83	2
	DRF	*4.55*	*4.60*	*4.64*	*4.67*	*4.70*	*4.72*	*4.74*	*4.76*	*4.77*	*4.78*	*4.80*	
15	C1S	40.63	57.77	74.17	90.03	105.47	120.58	135.41	149.99	164.36	178.55	192.56	-
	DRF	*4.71*	*4.77*	*4.81*	*4.84*	*4.87*	*4.89*	*4.91*	*4.92*	*4.94*	*4.95*	*4.97*	
Number of trees		-	-	1	3	3	7	10	6	-	-	-	30

[1]Regression equation for C1S flat dimension is $0.01228 \times \text{Dbh}^{2.25421} \times \text{Height}^{0.86844}$. Standard error of estimate=4.990 square feet. $R^2=0.97$.

[2]Dimension recovery factor equals volume of C1S in square feet divided by total cubic feet in tree to a 6-inch diameter top. Prediction equation for cubic feet equals $0.010895 \times \text{Dbh}^{1.75110} \times \text{Height}^{0.83901}$. Standard error of estimate for the regression is 1.179 cubic feet. $R^2=0.96$.

NOTE: Heavy black lines indicate distribution of data.

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